Ullrichii) produced by climate, by Dr. Kraatz.—On the anatomy of Turbellariæ, by L. Graff.

Section 7. *Anatomy and Physiology.*—On the texture of the cerebrellum of man, by B. Stilling.—On the time necessary for developing muscular currents, by H. Hermann.—On the nervus vagus, by Dr. Steiner.—Application of anilin-red for microscopical objects, by E. Hermann.—Contribution to the physiology of muscles, by Prof. Auerbach.—On Newton's law of temperatures with regard to animal heat, by A. Adamkiewicz.—Prof. Gscheidlen proved that the activity of nerves is connected with oxidising processes.—On the retina of snakes, by Dr. Flesch.

The Sections 8 (*Pathology*), 9 (*Medicine*), 10 (*Surgery*), 11 (*Ophthalmology and Otiatrics*), 12 (*Midwifery*), 13 (*Psychiatrics*), 14 (*Hygiene*), 15 (*Military Surgery*), and 20 (*Diseases of Children*), being devoted to medicine, must be omitted in this report; excepting, however, a paper read in Section 9, by Dr. Knapp, on the Styrian habit of arsenic-eating. The speaker introduced two men, fifty-five and twenty-five years old, who had been in the habit of eating arsenic for years, the former having contracted this habit in 1849, to save himself (in his opinion) from an epidemic of typhus then raging. The other, a farm-servant, applied arsenic to improve the health of cattle, and accustomed himself to its use. They have gradually increased the dose to about 0·5 gram. As_2O_3 or As_2S_3, taken once a week. They swallowed before the eyes of the Section 0·3 gr. of orpiment and 0·5 gr. of arsenious acid respectively. Only strong people seem to adopt this habit, and they do not appear to suffer in health through it. With women it has been known to produce abortus (see also Section 17).

Section 16 "Naturwissenschaftlische Paedagogic" (*on the Teaching of Science in Schools*) was composed of teachers, who discussed the means for teaching and the extent to which science should be taught in schools.

Section 17. *Agricultural Chemistry.*—On estimating atmospheric carbonic acid, by Dr. Fittbogen.—On experiments made in the agricultural station of Proskau on the influence of shearing in increasing the weight of sheep (it being found that shearing increases their appetite), and on the influence of arsenic in fattening animals, by O. Kellner. It appears that arsenic increases the power of digesting fat, and decreases the amount of nitrogen given off in urine, thus assisting materially in the formation of flesh.—On potato-feeding, by Dr. Wolf.—On the specific weight of seeds and on the bearing of analytical results on the physiological value of seeds, by G. Marck.—On fibrous plants and their cultivation in moors for the purpose of paper-making, by H. Stiemer.—On the value of animal protein, by Dr. Wild.—On the proportion of solid and liquid matter in plants in different periods of their vegetation, and on the decrease of salts in water used for watering fields in Westphalia, by Dr. König.—On the solubility of phosphates of lime, and on the treatment of bones with superheated steam, by Dr. Krocker.

Section 18. *Geography and Ethnology.*—Prof. Friesach explained a table destined for mariners to facilitate the finding of the shortest route between two points of the globe.—Dr. V. Zwiedinesk reported on a journey to the Wan Lake (Curdistan).—Von. Hochstaetter showed Mr. Mundy's photographs of New Zealand.—On the course of the Arctic vessel *Tegethof*, by Vice-Admiral Baron Wüllerstorff.—On Arctic ice, by Lieut. Weyprecht.—On the project of connecting the Algerian-Tunisian plain (Chotto or Sebkhas) with the Mediterranean, by G. Stache. The author is of opinion that the advantages of this (Capt. Rondaire's) project are not in proportion to its difficulties and costs.—On Dante's views on the advancing and receding of the sea, by W. Schmidt.

Section 19. *Anthropology.*—On prehistorical remains (urns) at Maria-Rast, near Marburg (Styria), by Prof. Müllner. This burial-ground was visited by the Section, as also the field near Leibnitz, where various bronzes have been found, and the tumuli near Purgstall; Count Wurmbrand acting as guide.—The latter reported on burial-grounds in Upper Hungary.—On a burial-ground near Innsbruck, by Dr. Wieser.—On Slavian legends, by Prof. Müllner.—On Keltic remains in Styria, by F. Ferk.—On the cavern of Byci-Scala in Moravia, by H. Wankel.—On diluvial man, by Count Wurmbrand.—On lake-cities (Pfahlbauten) in the moors of Laibach, by Dr. Deschmann.—On prehistorical walls and ditches in Hungary, by Dr. Romer.—On the natural law of the formation of states, by L. Gumplowicz.—On prehistorical measures, by R. v. Luschin.—On Keltic warfare, by Dr. Weiss.

A. OPPENHEIM

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, Nov. 11.—Prof. Cayley, F.R.S., in the chair.—Prof. Sylvester, F.R.S., gave an account of results arrived at in his communication "on the fifteen young ladies problem and a general mathematical theory of pure syntax." The problem, which was first considered by Mr. Sylvester more than twenty-five years ago, was not at that time published by him: it was then discussed by Prof. Cayley, next proposed by Rev. T. P. Kirkman in the "Lady's and Gentleman's Diary" for 1850: solutions were given in the "Diary" for 1851; but it was not until the year 1862 that an elaborate solution was given by Mr. W. S. B. Woolhouse in the volume for that year. The problem may be enunciated as follows:—"In a school of fifteen girls, a rule has been laid down that they shall walk out every day in rows of threes, but that the same two girls shall never come together twice in the same row. The rule is supposed to have been carried out correctly during the six working days of the week, but when the time comes for their going to church together on Sunday it is found to be absolutely impossible to continue it any further. Can the rule have been carried out correctly during the six previous days?"—Other papers brought before the Society were: "On the relation between Bernoulli's numbers and the binomial coefficients," by Mr. J. Hammond. The paper, which was accompanied by a coloured diagram, showing how certain four determinants for the numbers are formed of selected coefficients, contained some interesting numerical results which follow directly from certain division formulæ given in a former paper by the same writer.—"On three-bar motion in plane space," by Mr. S. Roberts. In this communication the author determines three foci, any two of which may be taken as centres of the link movement and the nature of the linkwork in each case.—"Values of certain infinite products, with an application to the summation of the geometrical series of the *n*th order as a definite integral," by Mr. J. W. L. Glaisher, F.R.S.—"On the form of cam which, acting on a lever, shall communicate a motion such that the angular velocity ratio of the lever and cam is a given function of the angle described by the latter," by Major J. R. Campbell.

Geological Society, Nov. 3.—Mr. John Evans, V.P.R.S., president, in the chair.—Mr. Thomas Andrew, 18, Southernhay, Exeter; Mr. Harry M. Becher, White Lodge, Barnes, S.W.; Mr. Arthur Back Kitchener, F.C.S., 19, Buckingham Street, Strand, W.C.; Mr. Daniel Morris, Grammar School, Burnley; Mr. Christopher Thomas Richardson, M.D., 13, Nelson Crescent, Ramsgate; and Mr. Gustavus A. H. Thureau, Lecturer on Geology and Practical Mining, School of Mines, Sandhurst, Victoria, were elected Fellows of the Society.—On some new Macrurous Crustacea from the Kimmeridge Clay of the Sub-Wealden Boring, Sussex, and from Boulogne-sur-Mer, by Mr. Henry Woodward, F.R.S. The first species described by the author belonged to the fossorial family Thalassinidæ, six species of which belonging to four genera are now found on the British coasts. The known fossil species are from the Chalk of Maestrich, the Greensand of Bohemia and Silesia, the Chalk of Bohemia, the Greensand of Colin Glen, near Belfast, and the Upper Marine Series of Hempstead, Isle of Wight. All these are referred to the genus *Callianassa*, which also includes the species from the Kimmeridge Clay described in this paper. The fossil is seen in profile on several sections of the core, and has the enlarged hands of the fore limbs more nearly equal in size than in the living species of *Callianassa;* the carapace and segments of the abdomen are smooth, and the latter are somewhat quadrate in profile, contracted at each extremity, and not pointed, and the caudal plates are oval. For this Crustacean the author proposes the name of *Callianassa isochela*. The second species described belongs to the genus *Mecochirus*, distinguished by the great length of the fore-limbs, which is equal to that of the whole body, the oldest known species of which (*M. olifex*, Quenst.) is from the Lower Lias of Würtemberg. It was obtained, together with *Lingula ovalis*, from the Kimmeridge Clay of Boulogne, by Mr. J. E. H. Peyton, after whom the author proposes to name it *M. Peytoni*. In this species the fore-legs are very finely punctate, and measure seventy-five millims. in length. The rostrum is somewhat produced, and the carapace, which is finely granulated, measures thirty millims. in length. The antennæ are long and slender. The abdomen measures forty-five millims., and the epimeral borders of the segments are falcate. The species is intermediate in size between *M. socialis*, Mey., and *M. Pearcei*, M'Coy, which the author regards as distinct. He also refers to *M. Peytoni* a pair of fore-limbs obtained from the Sub-Wealden boring.—On a new Fossil Crab from the Tertiary of New Zealand, by Henry Woodward, F.R.S. In this paper the author described a crab obtained by Dr. Hector, F.R.S., Director of the Geological Survey of New Zealand, from the "Passage-beds" of the Ototara series in Woodpecker Bay, Brighton, on the west coast of the south island of New Zealand. The new species belongs to the genus *Harpactocarcinus*, A. Milne-Edw., which includes six species from the Eocene of southern Europe. Its nearest ally is *H. quadrilobatus*, Desmar., but its carapace is much more tumid, especially in the branchial and gastric regions; the surface of the anterior half of the carapace is nearly smooth, and that of the posterior half finely granulated. The rostrum is short and very obtusely tricuspidate, the orbits shallow and rounded, the hepatic margin bluntly toothed, with a stronger tooth at the epibranchial angles; the divisions of the regions of the carapace faintly indicated, and there is a slightly roughened line on the sides of the gastric intumescence. The characters of the jawfeet and of the chelæ are described by the author; of the latter the right is considerably larger than the left hand. The specimen was a female. For this species the author proposed the name of *Harpactocarrcinus tumidus*. Dr. Hector explained the sequence of formations in the locality from which the above crab was derived, and stated that the Ototara series is to be regarded as Cretaceo-Tertiary, containing some fossils of decidedly Cretaceous type, such as Saurian bones and fragmentary *Inocerami*, and other forms that are associated with decidedly Mesozoic fossils in the underlying strata. On the other hand, the occurrence of Tertiary forms such as *Nautilus ziczac* (or a nearly allied form), the gigantic Penguin (*Palæeudyptes antarcticus*, Huxl.), and a Turtle, indicate a fauna not unlike that at present existing in the vicinity.—On a remarkable fossil Orthopterous Insect from the Coal-measures of Britain, by Mr. Henry Woodward, F.R.S. The author commenced by indicating the importance of the examination of the Clay-ironstone nodules of the Coal-measures, in which so many valuable fossils have been discovered, including the remarkable insect described in the present paper. The specimen displays the characters of the four wings, only two of which, however, are nearly perfect, and these measure $2\frac{1}{4}$ inches in length and 1 inch and $1\frac{1}{4}$ inch in breadth, the hind wing being the broadest. The author described in detail the characters presented by the venation of the wings, which includes three straight veins running parallel to the fore margin, the third bifurcating near the apex, a fourth much curved vein giving origin to six branches, and having at its base a triangular space, from which arise the other veins of the wing. The body appears to have been about five lines broad between the bases of the wings. In front of the wings is the prothorax in the form of two large, rounded, dilated, and veined lobes; it measures fourteen lines across and six lines in length. In front of these lobes is the head, with its eyes produced in front into a slender process three lines long. This insect is considered by the author to be most nearly related to the Mantidæ, the characters of the head and thorax especially being to some extent paralleled in the existing genus *Blepharis*. The author proposed to name the species *Lithomantis carbonarius*, and suggested that *Gryllacris* (*Corydalis*) *brongniarti* probably belongs to the same genus.—On the discovery of a Fossil Scorpion in the English Coal-measures, by Mr. H. Woodward, F.R.S. The author commenced by noticing the various European and American localities in which fossil Arachnida have been found in the Coal-measures. Hitherto no true Scorpions have been recorded from the English Coal-measures; but in 1874 the author received from Dr. D. R. Rankin a specimen from the Coal-measures near Carluke, which he regarded as the fossil abdominal segment of a Scorpion; in April last he obtained a fossil Scorpion from the Sandwell Park Colliery, and in August Mr. E. Wilson forwarded to him several specimens of similar nature in Clay-ironstone nodules from Skegby New Colliery, near Mansfield. The specimens are all very imperfect, but the author states that they most closely resemble an Indian form, which is probably *Scorpio afer*. He refers the English species provisionally to the genus *Euscorpius*, Meek and Worthen, and proposes to name it *E. anglicus*.—The Drift of Devon and Cornwall, its origin, Correlation with that of the South-east of England, and place in the Glacial Series, by Mr. Thomas Belt, F.G.S. The author described the general characters of the drift in the district under consideration, and stated that on the uplands the drift consists of undisturbed gravels and travelled boulders, which occur only in isolated remnants on the lower ranges, and that in the lowlands and valleys within 100 feet of the present level of the sea the gravels are widely spread, and show signs of sudden and tumultuous action. Between the upland and lowland gravels he considered that great denudation had taken place. He maintained that the boulders and the materials of the gravels had been distributed by floating ice, and that their presence on the summit of Dartmoor indicated that the water on which the ice floated must have extended up to 1,200 feet above the present sea-level; but he argued that this water was not that of the sea, because no old sea-beaches or remains of marine organisms are to be found in the region, although freshwater shells are preserved. He described these phenomena to the presence of a great freshwater lake, produced by the drainage of Europe being dammed back by a great glacier flowing from the north-west (Greenland) down the present bed of the Atlantic, and over the northern parts of the continent. The author discussed the characters of the superficial deposits in the southern and south-eastern counties, and indicated the points in which these seemed to bear out his hypothesis. The sequence of phenomena assumed by the author is as follows:—Accepting Mr. Tylor's notion that the actual sea-level must have been lowered during the Glacial period in consequence of the great accumulation of water in the form of ice at the poles, he seeks a point of departure at the Glacial period in the first evidence of such a lowering of the sea-level. The Weybourne sands and the marine beds of Portland Bill were deposited when the sea was at about its present level, and the Bridlington Crag probably belongs to the same period. The fossils found in these deposits show that the waters were cold. The first stage of the Glacial period is that of the older Forest-beds, and the immigration of a number of great Mammalia and of Palæolithic man indicates that the sea had retired from the British Channel and the German Ocean, leaving these islands connected with the Continent. A great river probably ran southwards through the region now submerged. The second stage is marked by the continued advance of the ice from the north, the retreat of the southern fauna and Palæolithic man, and the arrival of Arctic Mammals. The third stage saw the culmination of the Glacial period and the greatest extent of the Atlantic glacier, which reached to the coast of Europe, blocked up the English Channel, and caused the formation of an immense lake of freshwater by damming back the drainage of the whole of north-western Europe, as already indicated. In the fourth stage the Atlantic glacier began to retreat, and the sudden breaking away of the barrier of ice that blocked up the mouth of the Channel caused the tumultuous discharge of the waters of the great lake, by which the spreading of the lowland gravels was effected. To this cause the author attributes the formation of the Middle Glacial sands and gravels of Norfolk and Suffolk. During the fifth stage the ice of the German Ocean continued to retreat; but there was a temporary advance of the Atlantic glacier, which again blocked up the Channel, and produced a second great lake, which, however, did not attain so great a height as the first, and its waters were not discharged in the same tumultuous fashion. At this period the Upper Boulder-clay of Norfolk and Suffolk was formed; but the author is not convinced that this formation is represented south of the Thames except by the "Trail" of the Rev. O Fisher. In the sixth and last stage the Atlantic ice retreated as far as the north of Scotland, but the sea had not returned to its former level. The British Isles were connected with the Continent and with each other. To this the author assigns the last great Forest period, and the arrival of Neolithic man and the associated fauna from the Continent.

Astronomical Society, Nov. 12.—Prof. Adams, president, in the chair.—A valuable series of solar photographs were presented to the Society by the executors of the late Prof. Selwyn. They represent a period of rather more than eleven years, and so cover a complete cycle of sunspot frequency. The negatives are upon glass and have been taken upon a scale of four inches to the sun's diameter. The casket in which the Freedom of the City of London had been presented to the Astronomer Royal was shown to the meeting, and Sir G. B. Airy gave an account of the work that had been going on at the Observatory during the recess. Attention has been paid to the positions of the satellites of Saturn in connection with the ephemerides, which have been published by Mr. Marth in the *Monthly Notices* and *Astronomische Nachrichten*. A new eight-year Greenwich catalogue of stars is being published. Stella-spectroscopy has also been energetically followed up, and though the observations were at first somewhat discordant, latterly they have grown more consistent, and the results which have been obtained in the main verify those of Mr. Huggins as to the approach and recession of stars from and towards us in the line of sight. The Astronomer Royal remarked that Mr. Huggins had in this direction had the privilege of starting a new science, and it would be their duty at the Observatory to revise it; they intended to follow up the matter still further, but there were great difficulties still to be overcome, difficulties which no one could appreciate who had not attempted delicate work of the kind. They had also at the Observatory been applying themselves to photography, and had taken negatives of the sun with considerable regularity, though there were fewer spots to be observed now than at any former period which he could remember. Sir G. B. Airy also laid before the Society a map of the stars in the neighbourhood of Mars during its next opposition in 1877, and drew attention to the great advantages which this opposition would offer for the determination of the solar parallax.—Mr. De la Rue gave an account of the preparations that are being made both in France and Austria for the cultivation of physical astronomy. At Vienna an observatory is in the course of erection outside the city, on an area of some fifteen or seventeen acres. A central dome is being erected of 42 feet in diameter, which is to hold a 27-inch refractor, by Grubb, of Dublin.—Prof. Pritchard gave an account of the new Physical Observatory at Oxford, and of the mounting of the 12¼ inch refractor by Grubb, which has recently been bought by the University.—Lord Lindsay read a note on the progress of the reduction of his observations of the transit of Venus; and Mr. Bidder exhibited at the meeting and described an observing chair of simple and inexpensive construction.

Physical Society, Nov. 13.—Prof. Gladstone, F.R.S., president, in the chair.—The President stated that since the last meeting of the Society, Prof. Everett's important work on the Centimetre-Gramme-Second System of Units had been published by the Society. The book is based on the recommendations of a committee of the British Association, and consists of a collection of physical data concisely presented on the above system, a complete account being added of the theory of units.—Dr. Stone then read a paper on Thermopiles. He has recently been engaged in some experiments with a view to ascertain the best alloy for use in thermopiles. The thermo-electric power of a metal or alloy appears to be quite unconnected with its power for conducting heat or electricity, or with its voltaic relation to other metals, neither does it appear to have any relation to specific gravities or atomic weights. The thermopiles employed were of a form slightly modified from that employed by Pouillet in his demonstration of Ohm's law. Alloys are frequently more powerful than elementary metals, thus: 2 parts antimony and 1 part zinc have a negative power represented by 22·70, while that of antimony is 6·96 or 9·43, and of zinc is 0·2. A strange exception, however, is that of bismuth and tin, for while the power of bismuth is + 35·8, when the two metals are alloyed in the proportion of 12 to 1, the power becomes − 13·67. Dr. Stone first used a couple consisting of iron and rich German silver (that is, rich in nickel). This was characterised by great steadiness, but the electromotive force produced by moderate differences of temperature was not great. He then used Marcus's negative alloy, consisting of 12 parts antimony, 5 of zinc, and 1 of bismuth, but the crystalline nature and consequent brittleness of this mixture were found to be great objections to its practical use. It occurred to Dr. Stone that the addition of arsenic might diminish the brittleness without injuring the thermo-electric power, and on trial it was found that an alloy of zinc, antimony, and arsenic, with a little tin, formed a much less brittle mass than Marcus metal, with quite as great or greater thermo-electric power. A set of twelve couples of this alloy and German silver was exhibited. The electromotive forces of this set and of a similar one of twelve iron and German silver couples were determined by Mr. W. J. Wilson, and found to be, for one alloy and German silver couple with difference of temperature of 80° C., $\frac{1}{108}$ of a Daniell's cell. The electromotive force of one couple of the iron and German silver set was $\frac{1}{648}$ of a Daniell's cell. The ordinary method of applying heat by a trough of hot water is objectionable, for the water short-circuits some of the current. This is evident from the fact that if oil heated to the same temperature be substituted, a considerably greater deflection is obtained. Another method suggested by the author, which would tend to economy, is to allow petroleum to volatilise in the neighbourhood of one face of the pile, thus chilling it, and to ignite the mixture of air and gas so produced at the other face. Clamond's pile, consisting of iron and an alloy of zinc and antimony, was employed for some time, but although good results were obtained, the iron is liable to rust at the connections.—Dr. Guthrie remarked that in researches of this nature the main object in view was to ascertain what relation, if any, existed between the direction of the current and the amount of heat-flow. He referred to the experiment with a tangle of fine platinum wire, by which it is found that if either end of the wire be heated, a current flows towards the tangle, and this takes place however well the tangle may be annealed. Dr. Guthrie suggested that the great effect which alloying one metal slightly with another has on its position in the thermo-electric series may perhaps be connected with its change in conducting power for heat.—Mr. Walenn referred to experiments which he made some years since on thermopiles when used at high temperatures. The most powerful currents were obtained with a couple in which amalgamated copper was employed, but the power was soon lost in consequence of the volatilisation of the mercury. Subsequently he employed wires of wrought iron and German silver, and although the results were not specially remarkable at moderately high temperatures, the power became great when the connections were raised to a red heat.—Prof. Foster called attention to Matthiessen's table of the electric conductivities of metals and alloys in relation to the use of the latter in thermopiles. The fact shown by Matthiessen that the conductivities of alloys are greatly influenced by changes of temperature, will probably, he considers, be found to have some connection with their thermo-electric action. He also mentioned, as a fact which should be remembered when considering the construction of thermopiles, that the presence of minute traces of impurity completely changes the electric conductivity of a metal.

Anthropological Institute, Nov. 9.—Col. A. Lane-Fox, president, in the chair.—Major T. F. Wisden was elected a member.—Mr. Francis Galton, F.R.S., read the following papers:—"Heredity in Twins." On comparing the number of twins found among the uncles and aunts of twins with those found in similar classes of society generally, it appears that twin-bearing is hereditary, in so far that there is an excess per cent. of three individuals of twin birth in the former group. It further appears that the male and female lines contribute the twin-bearing tendency in identical proportions. The families are very large in which twins are born; even those of their parents average nearly seven persons, but the twins themselves appear neither to marry so frequently nor to be so prolific as other persons. However, the common belief that both twins are in no case fertile is quite untrue.—"A Theory of Heredity." Starting with the generally admitted view that the body consists of a multitude of organic units, each of which is to a certain degree independent of the rest, and with certain postulates which that view implicitly recognises, there exists a firm basis on which to establish a theory of heredity. By these and their necessary consequences, the object of double parentage, and therefore of sex, was first explained by the likeness and dissimilarities observed between brothers and sisters, and the still more remarkable similarities and contrasts between twins of the same sex, were then accounted for. It was argued that the germs which were selected for development into the bodily structure had very small influence in an hereditary point of view, but it was those germs that were never developed but remained latent, that were the real origin of the sexual element; by this hypothesis the almost complete non-transmission of acquired modification was explained; also the occasional fact that strongly marked characteristics in the parents were sometimes barely transmissible, and again that of certain diseases skipping alternate generations. It was further supposed, in the successive segregations and segmentations of the earliest germinal matter, that the divisions were never precise, and therefore that alien germs were ultimately included in each structure; thus latent germs of all kinds became distributed over all parts of the body. This accounted for much that Mr. Darwin's theory of Pangenesis over-accounted for, and was free from objections raised against the latter. The assumed evidence that structural changes under modified conditions of life reacted on the sexual elements was then discussed, and it was pointed out that much that had the appearance of heredity was not so in fact, but was due to changes of the sexual elements collaterally with the structural ones. A modification of Pangenesis was adopted, as a subsidiary part of the main theory, to account for the occasional and limited transmission of acquired modification. The precise character of the relationship that connects the offspring with the parents was then defined.—Mr. F. W. Rudler, F.G.S., read a report on the Department of Anthropology at the Bristol meeting of the British Association.

Institution of Civil Engineers, Nov. 9.—Mr. Thos. E. Harrison, president, in the chair.—The paper read was on the Manora Breakwater, Kurrachee, by Mr. William Henry Price.

CAMBRIDGE

Philosophical Society, Nov. 1.—Mr. Pearson read a paper on Aristotle's notion of "Right-Handedness;" and added some remarks on a theory of his own on the subject.

BOSTON

Natural History Society, May 5.—This was the Annual Meeting, when Prof. Hyatt, the Custodian, presented his report, in which he described the condition of the numerous collections belonging to the Society. The following papers were read:—On some of the habits of the Blind Crawfish (*Cambarus pellucidus*), and the reproduction of lost parts, by F. W. Putnam.—Synopsis of the Odonata of America, by Dr. H. A. Hagen.

PARIS

Academy of Sciences, Nov. 8.—M. Frémy in the chair. The following papers were read:—Discovery of two small new planets, at the Observatory of Paris, by MM. Paul and Prosper Henry, by M. Leverrier.—Memoir on measurement of the affinities in the reaction of two solutions on one another, taking as bases the electromotive forces, by M. Becquerel.—On the alcohols which accompany vinic alcohol, by M. Is. Pierre.—On the exhaustion of the soil by apple-trees, by M. Is. Pierre. He estimates that an annual supply of about 80 kilogrammes of manure would be required for a single tree, to maintain the original fertility of the ground.—Observations by M. P. Thenard on M. Pierre's communication.—M. de Lesseps presented the second volume of his work on the History of the Suez Canal.—On the separation of mixed liquids and on new maximum and minimum thermometers, by M. Duclaux. It is always possible to begin with a mixture (at a given temperature) such that on lowering the temperature very little (much less than the tenth of a degree), it divides into two layers of equal volume; *e.g.* a mixture of 15 c.c. amylic alcohol, 20 c.c. ordinary alcohol, and 32·9 c.c. water, at 20°. The thermometers on this principle are easily made, cheap, solid, and resistant to shocks and pressure, though, of course, a special mixture is required for each.—Note on the determination of cafeine, and the solubility of this substance, by M. Commaille.—On a process for separating cholesterine from fatty matters, by M. Commaille.—On the various modes of structure of eruptive rocks, studied with the microscope, by M. Michel Levy.—Researches on the inversion of cane-sugar by acids and salts, by M. Henry.—Comparison of unipolar excitations of the same sign, positive or negative: influence of increase of the current on the value of these excitations, by M. Chauveau. In medical use of electricity, he finds that to manage the current with regularity, unipolar excitation should be used with the positive pole for motor, and with the negative for sensitive, nerves.—On the anatomy and histology of Lucernaria, by M. de Korstneff.—Treatment, with sulphocarbonates, of the spot which indicated the appearance of Phylloxera at Villié-Morgon, by M. Duclaux.—On electro-capillary currents produced by mineral caustics, by M. Onimus.—On the influence of acids on coagulation of blood, by M. Oré. Neither acids nor alcohol coagulate albumen when injected directly into the circulation; and most substances insoluble in water, but which cease to be so in presence of acids and of alcohol, may be injected without causing coagulation, after being submitted to the action of these.

GENEVA

Society of Physics and Natural History, Oct. 7.—Prof. Alfred Gautier gave an account of the meteorological observations made in Labrador by the Moravian missionaries at various stations in that northern region. The first notice, published by him in June 1870 (*Archives des Sciences*, tome xxxviii. p. 132), referred to the first documents of that kind sent by the missionaries from 1778 to 1780, and published in the Phil. Trans., vols. 69 and 71; then a second series, made from 1841 to 1843, contained in the *Annales* of M. Lamont, of Munich. A new series of observations has been undertaken since 1867, by means of thermometers sent from Geneva by M. Gautier, and it has been continued more or less regularly by the missionaries. Results have been received from four stations; that of Hopedale, from 1868 to 1874; Zoar, for one year, from Sept. 1870 to Sept. 1871; that of Hebron, from Sept. 1869 to August 1870; Rama, the most northerly, from July 1872 to June 1874. Hopedale is situated in 55° 39′ N. lat. The annual means of temperature in Centigrade degrees, drawn from three observations daily, made at 7 A.M., 12 noon, and 7 P.M., are as follows:—

December	1868 to	November	1869	− 3°·04
,,	1869 ,,	,,	1870	− 3°·42
,,	1870 ,,	,,	1871	− 2°·83
,,	1871 ,,	,,	1872	− 2°·32
,,	1872 ,,	,,	1873	− 3°·63

The mean of five years is thus − 3°·09. Compared with the mean of Edinburgh (in an even more northerly lat., 55° 57′), which is about 8°·4, it indicates the enormous difference existing between the temperatures of corresponding latitudes on the western coast and in the eastern regions of the North Atlantic. The mean of the seasons at Hopedale deduced from the collective observations is as follows: Winter, −18°·0; spring, −5°·5; summer, 9°·0; autumn, 1°·3. The minimum temperature in winter is from −26° to −36° below zero. The absolute minima observed have been −38° on Feb. 3, 1870, and −39° on Feb. 2, 1873; on March 1, 1874, −35° was observed. In July and August there was not much frost, and vegetation prospered. The thermometer rose to 29° and even 30°, which it reached on July 26, 1871. The daily variations resulting from five years' observations rose in the mean to 4°·49. Its monthly maximum was 6°·6 in June 1873, and its minimum 1°·4 in November 1869. It is accidentally sometimes much more considerable. The most notable instance was on Oct. 11, 1871, when the thermometer, which indicated −4°·2 at 7 A.M., sank at 7 P.M. to −27°. The barometric observations made at Hopedale present inconsiderable variations. In the neighbouring districts these variations being often very sudden and very extended, it may be asked if the instruments used are in a satisfactory condition. Since the heights reached vary between 29 and 30½ English inches, it may be presumed that the tube is quite free from air? This is a point deserving a special inquiry. From the three daily observations made at the station of Zoar from September 1870 to August 1871, may be deduced a mean annual temperature of −2°·26. Zoar is situated in about 56° of N. lat. At Hebron two daily observations at 7 A.M. and 2 P.M. during one year, from September 1869 to August 1870, give a mean of −3°·6. The latitude is about 58° 20′. The two previous years gave an annual mean of −4°·5, and besides former observations in 1841–2, a mean of −5°·3. Finally, at Rama, situated in about 60° N. lat., the annual mean in 1872–3 was about −5°·6.

BOOKS AND PAMPHLETS RECEIVED

BRITISH.—Bamboo considered as a Paper-making Material: T. Routledge (Spon).—Four Thousand Miles of African Travel: Alvan S. Southworth (Low and Marston).—Artes Africanæ: Dr. G. Schweinfurth (Low and Marston).—Journal of the Royal Agricultural Society of England. Vol. ii. Part 2 (Murray).—Notes on Forestry: C. F. Amery (Trübner).—Tenth Annual Report of the Quekett Microscopic Club.—The White Conquest: William Hepworth Dixon (Chatto and Windus).—The Potton and Wicken Phosphatic Deposits: J. J. Harris Teall, B.A., F.G.S. (Deighton, Bell, and Co.)—The Nature of Light, with a general account of Physical Optics: Dr. Eugene Lommel (H. S. King).—Science Lectures for the People, delivered in Manchester. 1st and 2nd, 3rd and 4th, 5th and 6th series (Manchester, John Heywood).—Theory of Heat: J. Clerk-Maxwell, M.A., LL.D. (Longmans).—Papers on Glacial Geology: T. Mellard Reade, C.E., F.C.S. (Liverpool Geological Society).

CONTENTS

PAGE
MR. GLADSTONE AT GREENWICH 41
CHAMBERS'S ENCYCLOPÆDIA 42
EGYPT AND THE NILE 43
OUR BOOK SHELF:—
Routledge's "Discoveries and Inventions of the Nineteenth Century" 45
LETTERS TO THE EDITOR:—
Scientific Research for the Promotion of Science.—Prof. PIAZZI SMITH 45
Ericsson's Researches on the Sun.—P. A. SECCHI 46
Sir G. B. Airy and the National Standards.—Sir G. B. AIRY, F.R.S. 46
The Origin of Our Numerals.—JOHN ALLAN BROUN 47
On the Cup-shaped Joints in Prismatic Basalt.—G. P. SCROPE, F.R.S. 47
A New Palmistry.—R. A. PRYOR 47
OUR ASTRONOMICAL COLUMN:—
The Minor Planets 47
SCIENCE TEACHING TO YOUNG CHILDREN. By Rev. G. HERBERT WEST 48
THE THEORY OF "STREAM LINES" IN RELATION TO THE RESISTANCE OF SHIPS. By WM. FROUDE, F.R.S. (*With Illustrations*) 50
NOTES 52
THIRD REPORT OF THE SETTLE CAVE COMMITTEE (VICTORIA CAVE). By R. H. TIDDEMAN, F.G.S. 55
GERMAN SCIENTIFIC AND MEDICAL ASSOCIATION. By Dr. A. OPPENHEIM 56
SOCIETIES AND ACADEMIES 57
BOOKS AND PAMPHLETS RECEIVED 60